

Evaluating the Impact of Brown Trout on the Native Fishes of the Trinity River

Justin Alvarez

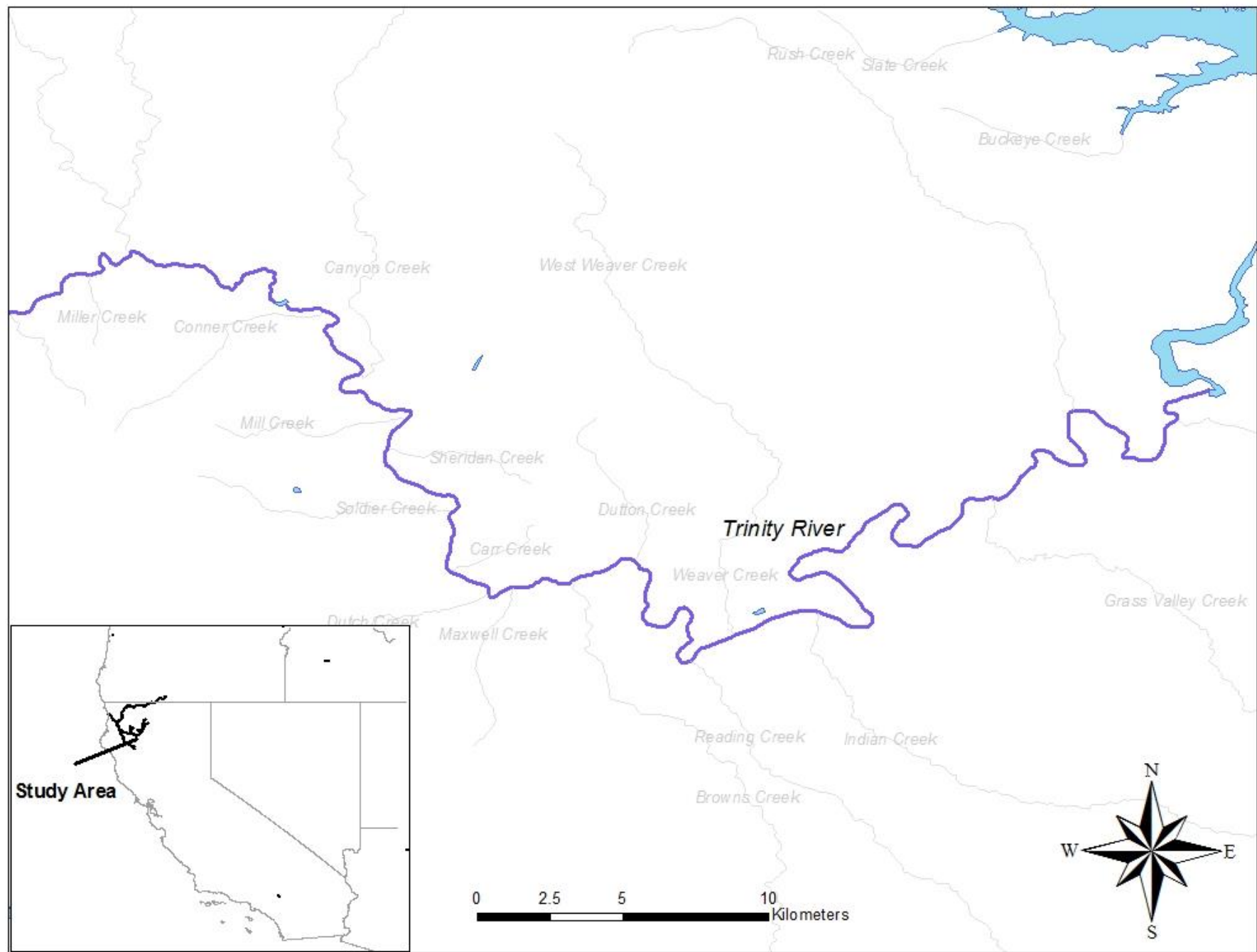




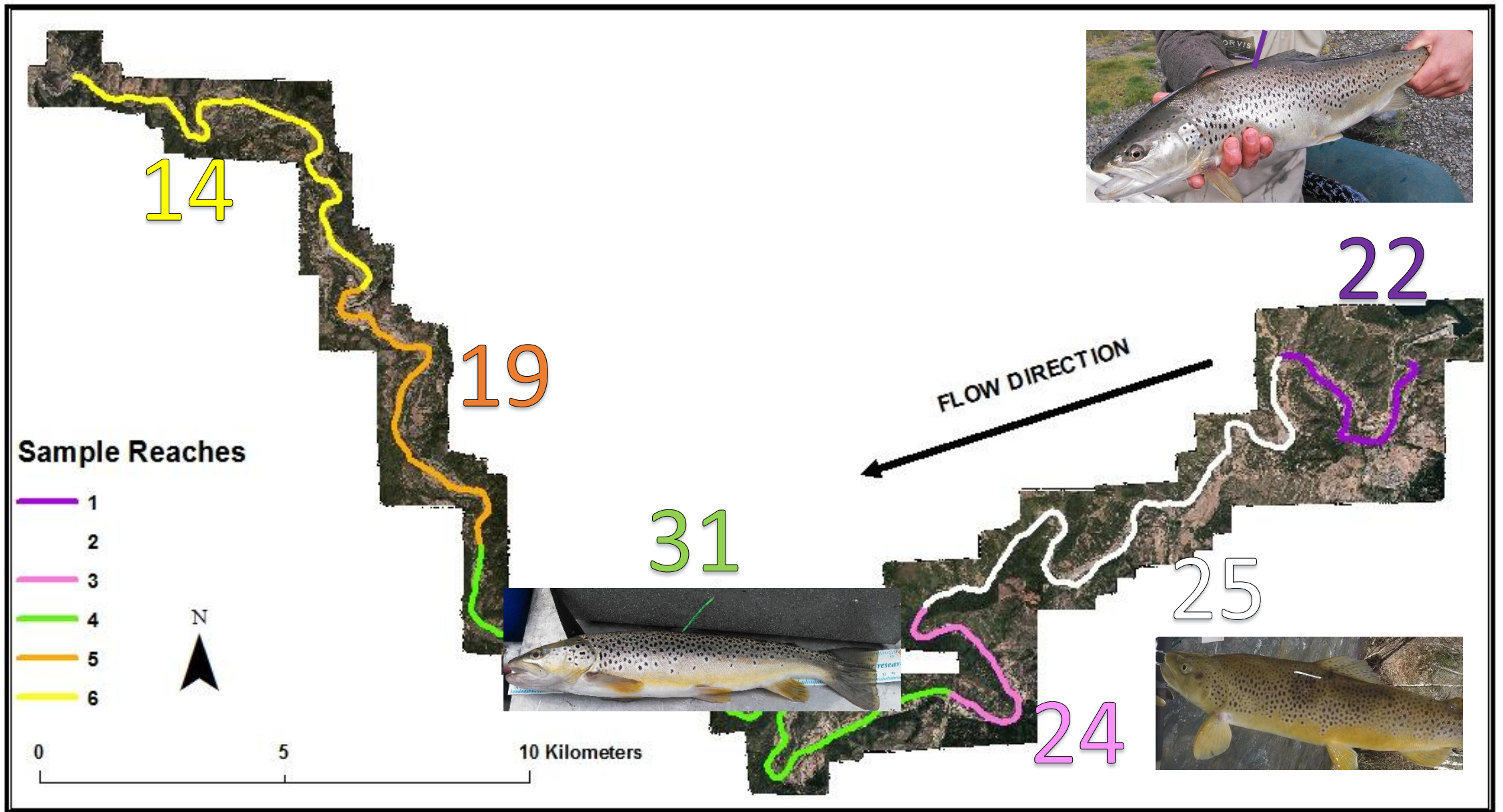
ScouHarméls;Exótic??River

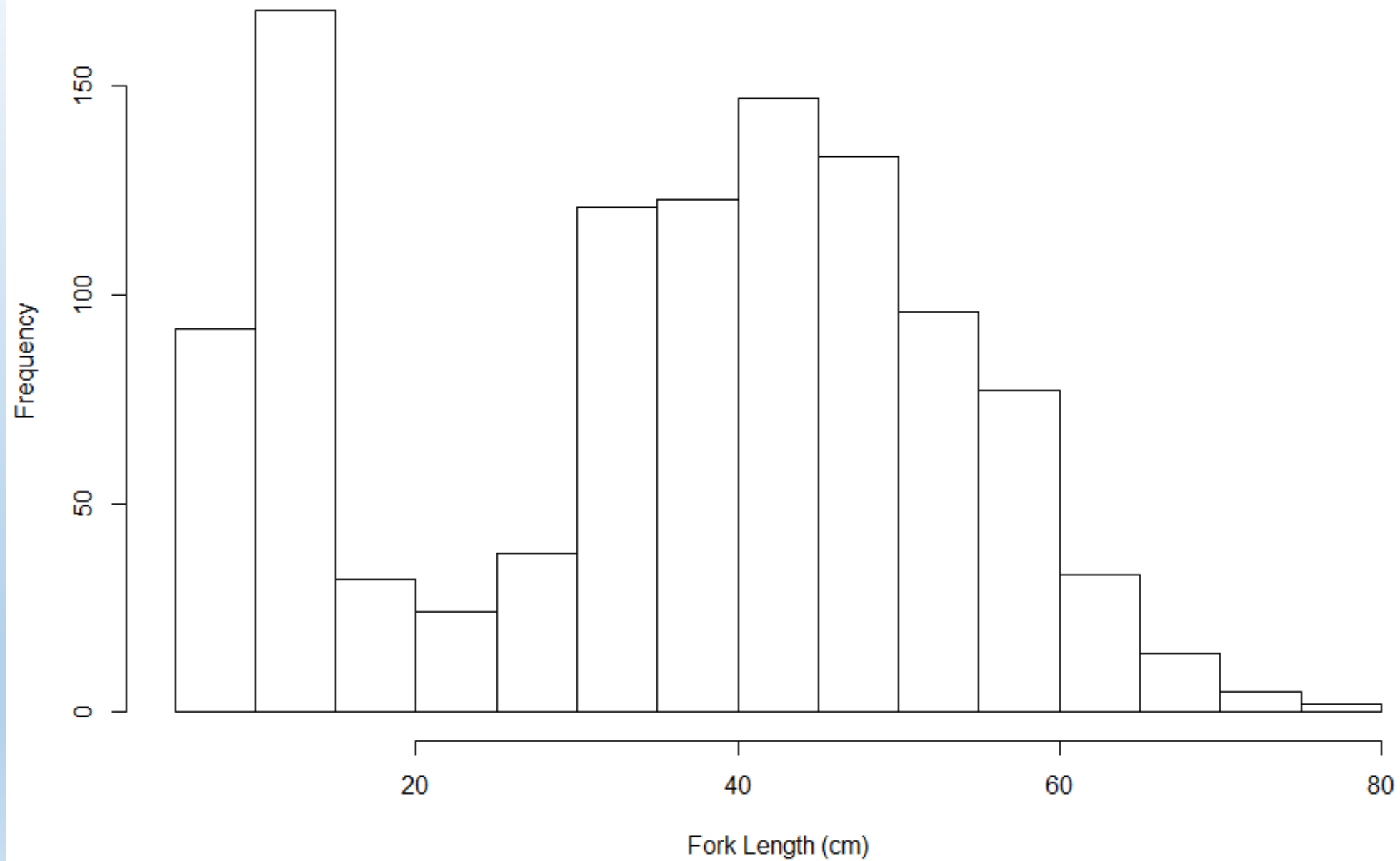
Objectives

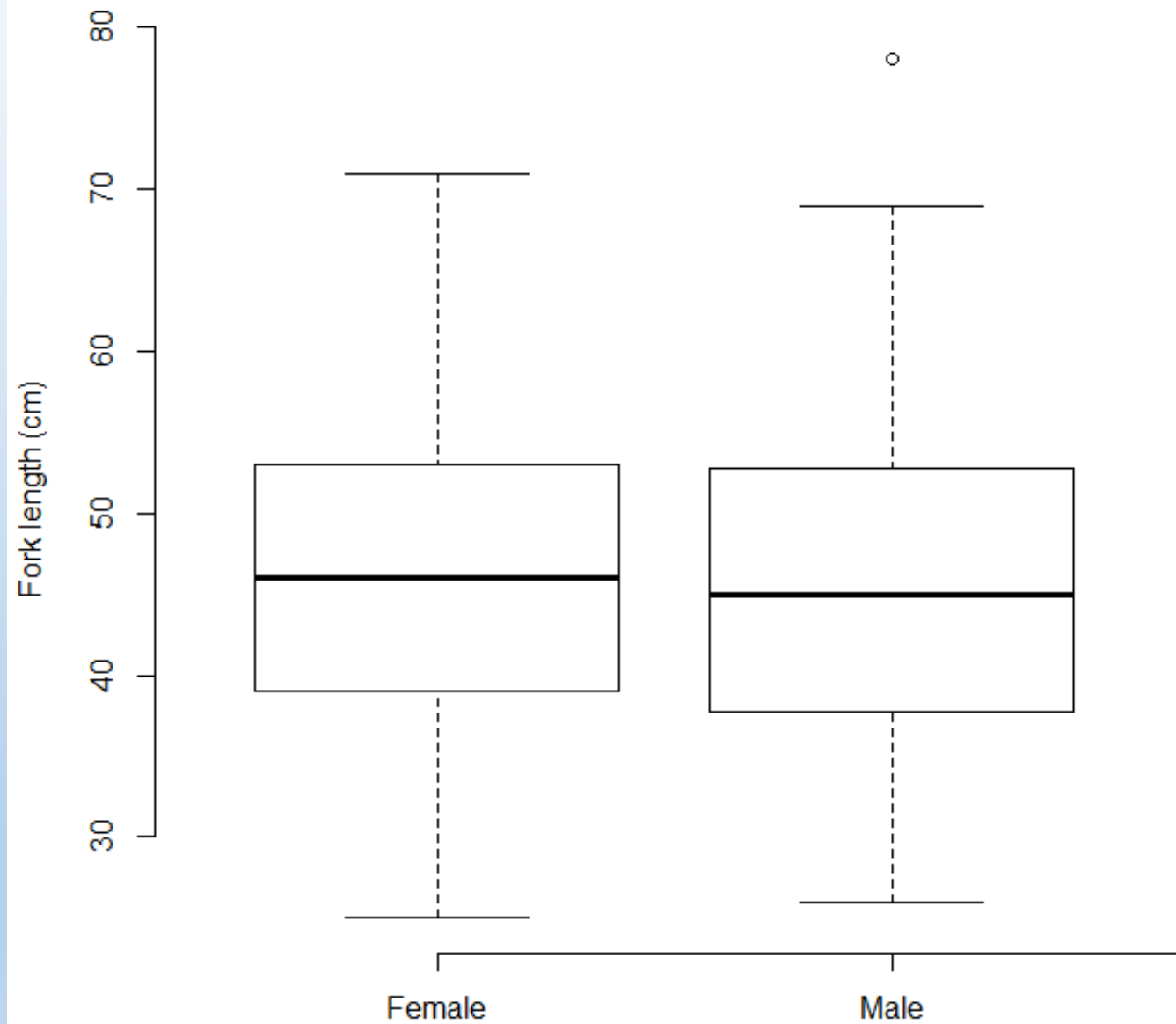
- Population Estimate
- Age Structure
- Size Structure
- Growth
- Diet through out the year



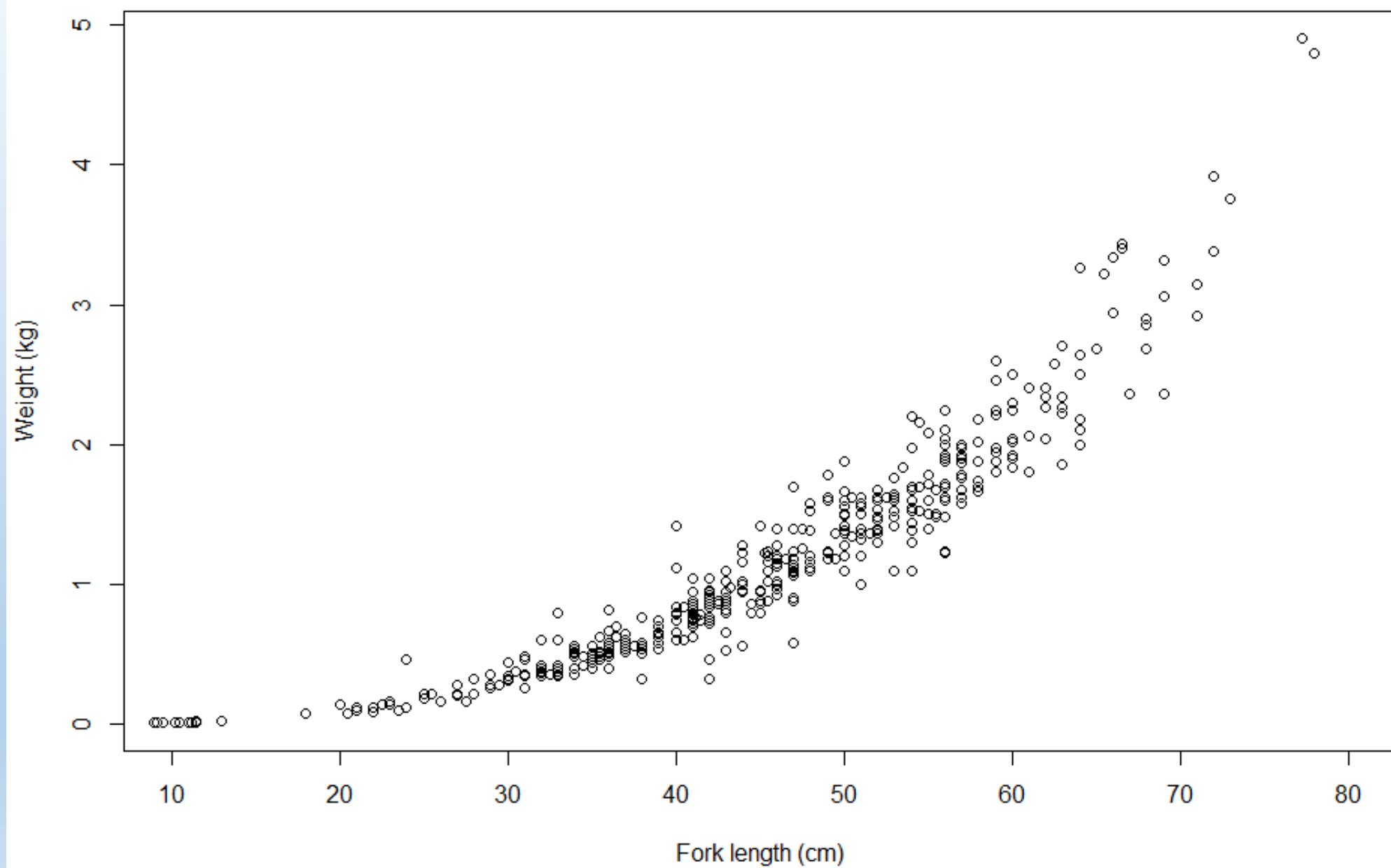


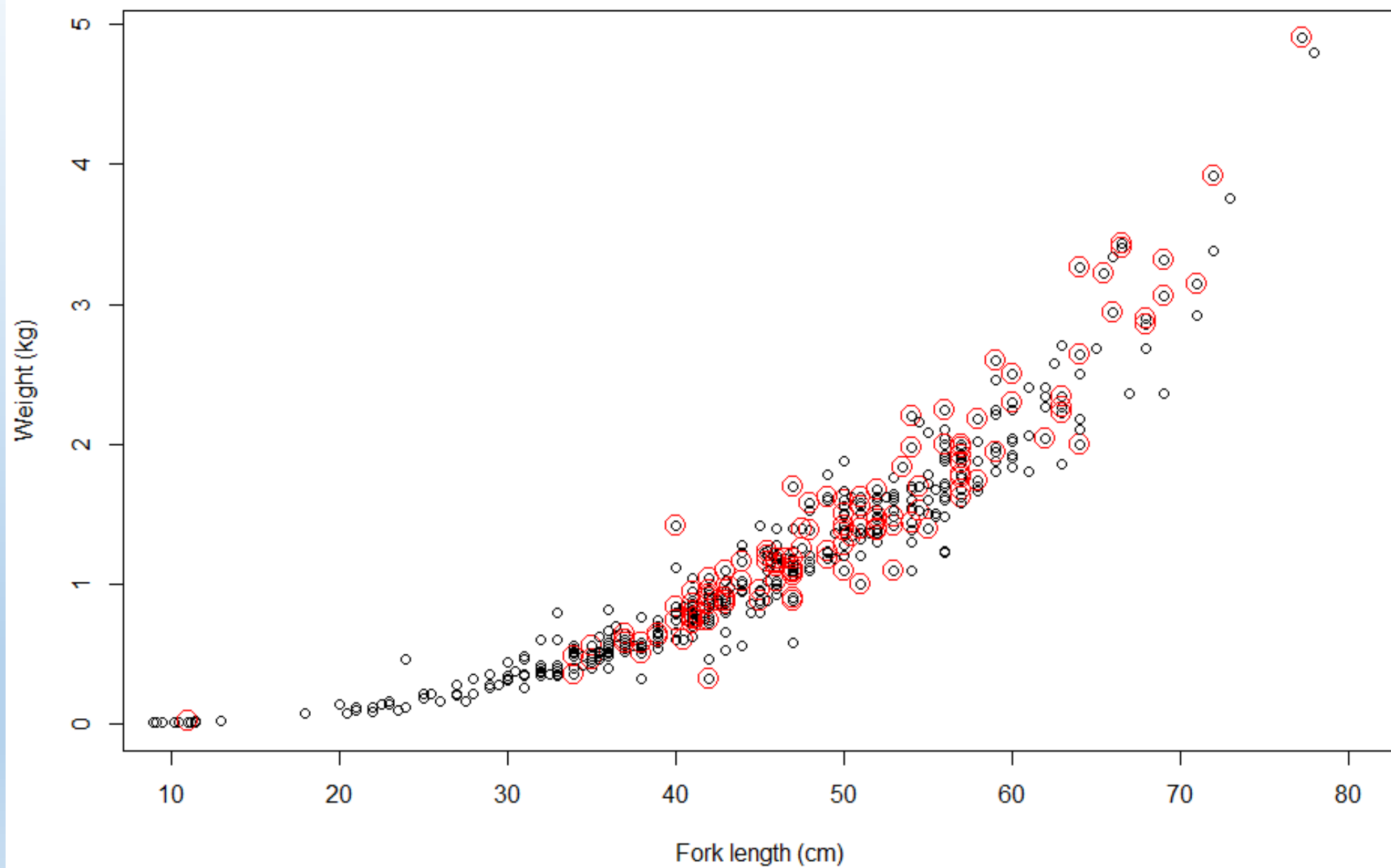






10.5 lb
Male



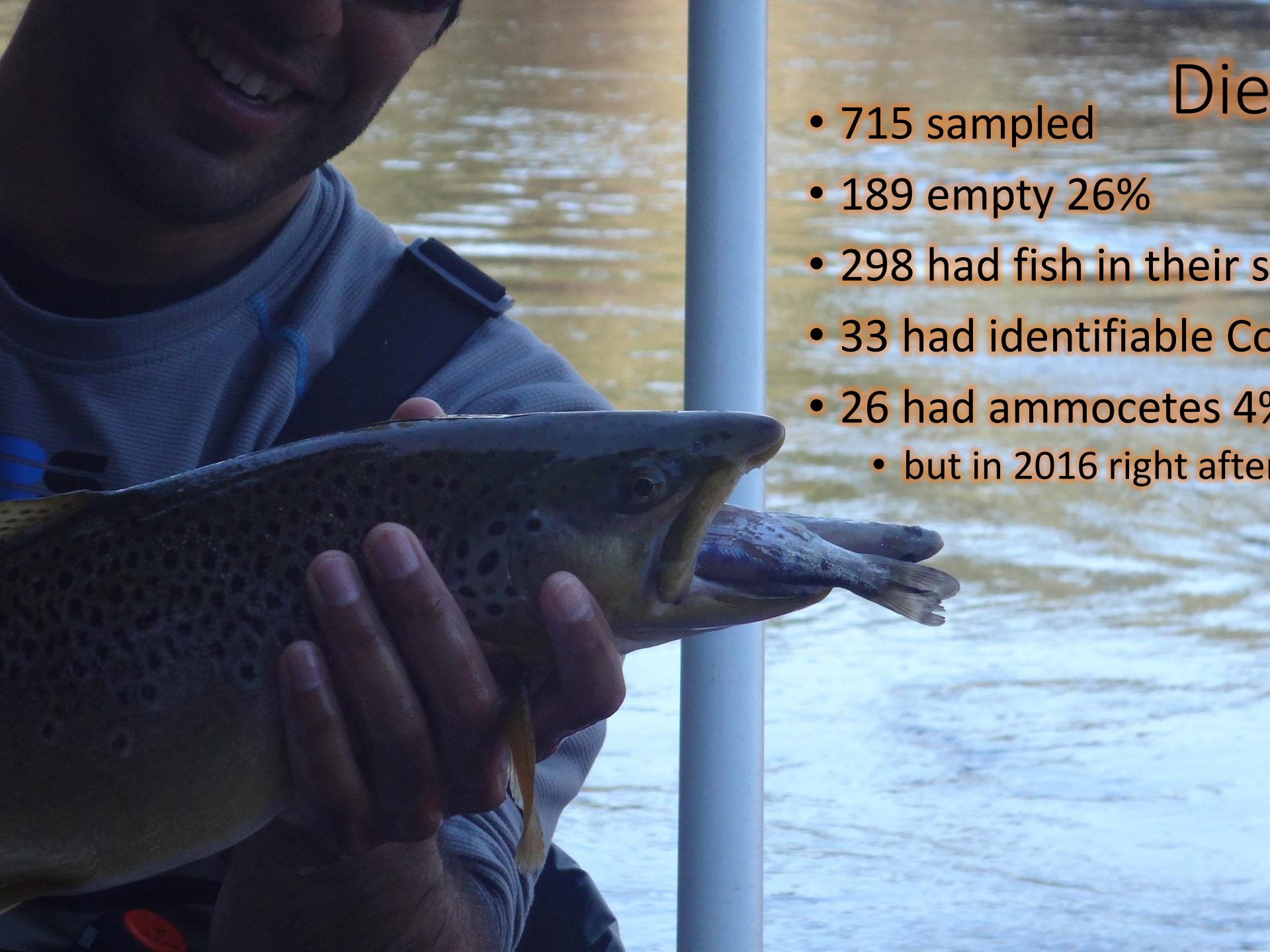






- Lamprey
- Pacific Giant Salamanders
- Yellow Legged Frogs
- Three-spine stickleback
- Speckled Dace

Brown Trout
Barf Bucket



Diet Proportions

- 715 sampled
- 189 empty 26%
- 298 had fish in their stomach 42%
- 33 had identifiable Coho salmon 5%
- 26 had ammocetes 4%
 - but in 2016 right after rain 19 of 116 ~ 16%

Theoretical caloric need

2015 population estimate N=1500

Size range from 20-80 cm in 5 cm bins

Number per bin based on frequency histogram

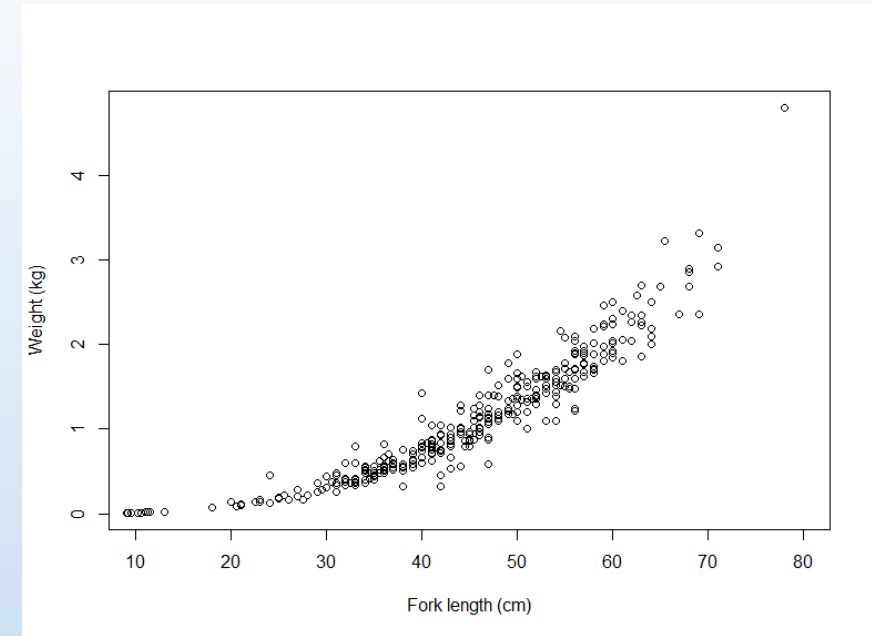
Assumptions

- Temperature at Douglas City

- No change in mass from January 1 to December 31

- Fish weight in each bin is predicted from the middle FL value

- The mass consumed is of similar energy density to the brown trout that ate it



Theoretical caloric need

Brown Trout Biomass – 1611 kg

Amount Consumed – 9678 kg

If eating only 120mm fish ~20grams = 483,900 fish

If broken out by the proportion that ate fish = 203,238 fish

If only inverts= 13,385 kg of mayflies/stoneflies

~9,000,000,000 individual inverts

Every brown trout would have to eat

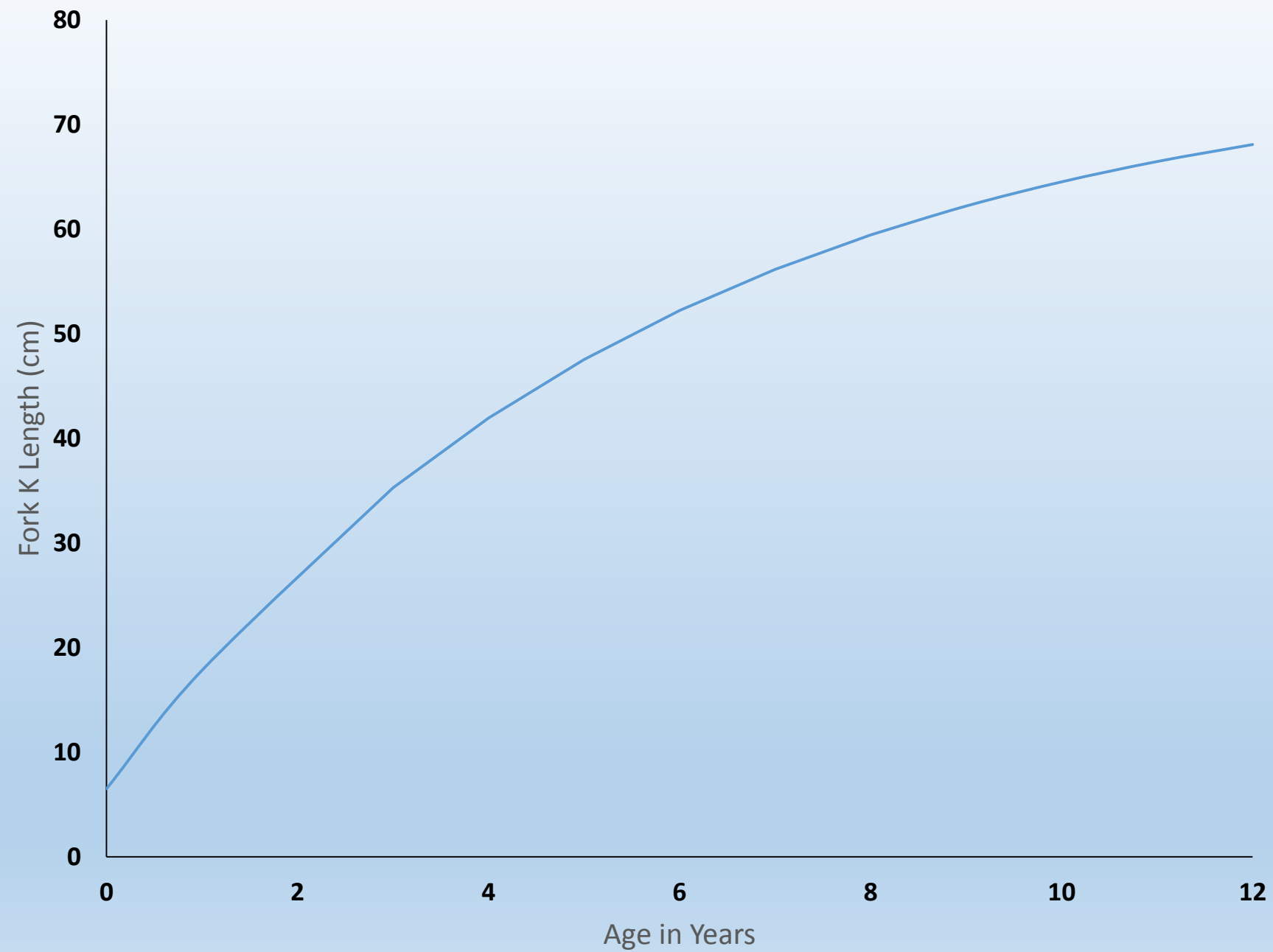
3.5 insects/second

300k hatchery coho

4.6 mil hatchery chinook

800k hatchery steelhead





Theoretical caloric need with Growth

Brown Trout Biomass – 1611 kg

Amount Consumed –11,844 kg

If eating only 120mm fish ~20grams = 592,200

If broken out by the proportion that ate fish = 250,238 fish

If only inverts= 16,380 kg of mayflies/stoneflies
~166,000,000,000

Every brown trout would have to eat
64.5 insects/second

300k hatchery coho

4.6 mil hatchery chinook

800k hatchery steelhead



Management Considerations

- Coho salmon and steelhead trout are disproportionately impacted
- Brown trout could be managed through fishing regulations and active suppression if political will is there.
- Given over \$150 million dollar investment in recovery of native fishes and a small but active recreational fishery, how do you balance restoration goals and recreational fishing interests?
- Would resident rainbow trout populations fill the ecological niche currently filled by brown trout if suppression was implemented?

Questions?

